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C.D. Howe Institute COMMENTARY

MONETARY POLICY

As Good As It Gets?

The International Dimension to Canada's Monetary Policy Strategy Choices

Pierre L. Siklos

In this issue...

The Bank of Canada must take careful account of the international environment, where inflation-targeting has become widespread, as it considers where Canada should go from here – once the current inflation-control target agreement expires in 2011.

The Study in Brief

This *Commentary* asks: how has the international experience with monetary policy changed over the past decade or so? It considers the consequences of the spread of inflation-control regimes worldwide in shaping where Canada goes from here – once the current inflation-control-target agreement expires on December 31, 2011.

At the heart of all inflation-targeting (IT) regimes is the core belief that a low and stable inflation rate is a desirable goal. The fact that the public can be convinced of the desirability of such a goal stems in no small measure from the emergence of a consensus about the appropriate social utility function that ought to govern a central bank's actions.

Inflation targeting has spread around the world. There is some diversity in what is targeted, how this is accomplished, and over what time-horizon the chosen objective is to be attained. The likely source of IT's success is that this strategy is better able to anchor inflationary expectations, and delivers the appropriate stance of monetary policy in a more consistent manner. The paper points to the need to deal explicitly with some questions about the Canadian economy's performance under inflation targeting, especially in light of the large shocks that have hit our economy in recent years. For example, the Bank of Canada could be more explicit about how it might pre-empt the consequences of stresses in the economy and the financial system to avoid the accusation that it is an effective enabler of asset price bubbles. Accordingly, this is a good time to reconsider the regime's configuration. The principal lesson is that the Bank must take careful a count of the international environment in which it has been and will be operating. The Bank's failure to emphasize international matters in 2006, when it set out its remit for reviewing the program, was a serious omission.

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INDEPENDENT • REASONED • RELEVANT

This *Commentary* focuses on two interrelated issues. First, how has the international experience with monetary policy changed over the past decade or so? It considers the consequences of the spread of inflation-control regimes worldwide in shaping where Canada goes from here once the current inflation-control-target agreement expires on December 31, 2011. What does this portend for the conduct of monetary policy in Canada? Second, as the date for the renewal of Canada's inflation targeting regime approaches, what elements of the existing policy regime deserve attention?

In particular, policy questions that may have been overlooked, based on an assessment of the international experience, will be addressed. The objective, of course, is to evaluate and, if necessary, to improve how well the current monetary policy strategy is able to not only deliver low and stable inflation, but to buttress itself against the potential criticism that, in the face of recent shocks and crises in the world economy, more wholesale change to Canada's regime is required.

There is a sense in which policymakers in Canada can be accused of complacency about the potential threats from abroad, and possibly from within, that could threaten the survival of the monetary policy regime in its present form. Lulled into the belief that it is enough to have a coherent but domestically oriented monetary policy regime, and focused on an explicit inflation-control target and a floating exchange rate, they may not adequately take into account external pressures. For example, the history of the Canadian dollar, ably documented by Powell (1999), suggests that, while policymakers at home have historically preferred a floating exchange rate regime, events beyond their control have on several occasions forced our country away from the free float only to return to it, often when the international cooperation or coordination required to make alternative monetary regimes function, breaks down.[1]

Since Canada is on the periphery of economies that will dictate the make-up and structure of future international monetary relations, the prospect of deciding what happens after 2011 gives Canada's policymakers the opportunity not only to take a look back but to improve on a policy that, since 1991, has consistently delivered lower average inflation than in the US or the euro area. They should not shy away from more prominently defending its virtues on the world stage, or considering potential avenues for improvement, lest it is trampled by an imminent desire on the part of major economic powers to construct a new international monetary order not entirely suited to Canada's economic needs.[2]

As this is written, the financial shock that originated in the US, and spread worldwide, has prompted renewed calls for greater policy cooperation, if not coordination, seemingly

An earlier version of this paper was presented at the C.D. Howe Institute Policy Conference: Canada's Monetary Policy Regime after 2011. Comments on an earlier draft by Andy Filardo, Charles Goodhart, Robert Hetzel, Peter Howitt, David Laidler, and Andrew Spence, are gratefully acknowledged. I am also grateful to Nergiz Dincer for providing me with the data used in Dincer and Eichengreen (2007). Results not presented in the main body of the paper are relegated to an online technical appendix available at http://www.wlu.ca/sbe/psiklos (Research). A previous draft was presented at the Sixth HKIMR workshop, August 2008. Parts of this paper were completed while I was Bundesbank Professor at the Freie Universität, Berlin.

1 The return to Bretton Woods in May 1962 is an example of the pressure placed on Canada to follow some international standard. Bretton Woods, of course, collapsed in the early 1970s and, following a period of managed floating, the Canadian dollar freely floats to this day. Possibly one exception suggesting that Canada can go it alone is the decision in 1950 to float. Nevertheless, here too there was quiet assent given to this decision by the international community, especially the United States.

2 Paul Volcker is one influential policymaker who not only regrets the end of Bretton Woods but continues to imagine a future that includes more international central bank policy coordination. See, for example, Volcker and Gyohten (1992, Chapter 8).

oblivious to the mechanisms that currently exist among central banks, in particular, to carry out necessary interventions.[3]

The Current Environment

In 2009, the Reserve Bank of New Zealand celebrates 20 years of inflation targeting (hereafter IT). Canada's turn comes in 2011. The record of inflation in Canada over the past decade relative to the US experience is impressive, as seen in Figure 1. With very few exceptions, Canada's inflation rate has been below that of the US since 1991, when IT was introduced. Indeed, the cumulative inflation advantage Canada has enjoyed over the US, between the second quarter of 1991 and the end of 2007, is almost 45 percent; not an insignificant figure.[4]

The Remarkable Story of Canadian Inflation

Figure 2 plots inflation objectives in Canada, alongside a selection of inflation forecasts, since 1991 when IT was introduced. For the most part, expectations of inflation have remained inside the target bands, especially since 1995 when the 1-3 percent corridor was established and thereafter left untouched. Moreover, whenever a forecast breached the target, it did not take long before expectations returned inside the target range. In addition, long-term inflationary expectations, as proxied by the difference between the yields on long-term government bonds and on inflation-indexed government bonds, have remained well within the inflation-control objectives since 1997. Notice, however, that there continues to be some disagreement about inflationary expectations throughout the period examined. Less celebrated perhaps has been the durability of the regime, particularly as policy regimes that preceded IT since World War II showed themselves unable to match its success in this regard.

Since 1989, when inflation reduction targets were introduced in New Zealand, this type of policy framework has spread throughout the world. There are now almost 30 countries that target inflation in a more or less formal fashion.[5] Several other central banks, most notably the United States, Switzerland, and the euro area are considered to be *de facto* adherents to a policy of IT. It is also the case (see Appendix A) that the degree of economic and political independence of central banks in IT economies is significantly higher than in economies that have chosen not to adopt this kind of monetary policy strategy. This reflects a political decision in these countries to provide the means for their central banks to do what central banks have claimed all along to be designed to do, namely fight inflation (Siklos 2002).

There are a number of remarkable features about how this state of affairs has emerged over time. The adoption of IT was not normally the consequence of some economic or financial crisis in the countries that, early on, chose to adopt this strategy, although, in some instances, a crisis did help to motivate policymakers to consider the adoption of an explicit inflation objective.[6] Repeated banking crises in earlier decades led to the creation of the Basel Committee, and greater

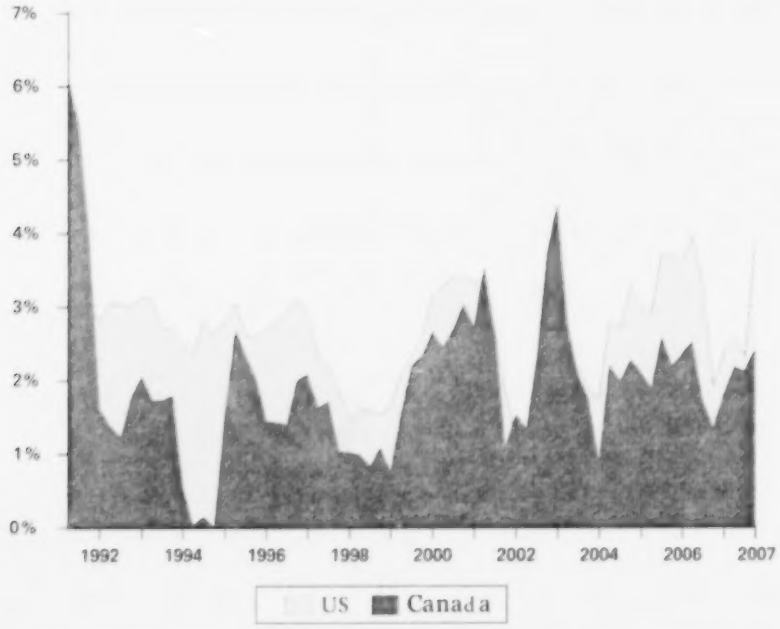
3 Perhaps the most recent expression of the need for more coordinated intervention comes from the IMF's *Global Financial Stability Report* (2008a). This report acknowledges the reality of what central banks (e.g., as in the case of the US Federal Reserve) have worried about for several months; namely the emergence of an "adverse feedback loop," wherein tight credit conditions are further reinforced by weakening global economic performance.

4 In US policy circles the preferred inflation indicator is the Personal Consumption Expenditures (PCE) deflator, which is not, strictly speaking, comparable to the CPI.

5 According to Rose (2007, Appendix A) 27 countries adopted inflation targets by 2006. If we subtract Finland and Spain, both of whom joined EMU, add Kazakhstan and Albania to the list, the total remains the same. In addition, the IMF (2006) estimates that there are 33 other countries expected to adopt IT in the next 5 years or so. This implies that potentially a third of all countries around the world will have adopted a version of this monetary policy strategy.

6 New Zealand might be an exception since inflation became high and unstable during the 1980s. Nevertheless, it must be kept in mind that IT was introduced to that country almost four years after the NZ dollar began to float, and after a large number of fiscal and other structural reforms were enacted. In a sense IT represented the culmination of wrenching changes to the New Zealand economy. See Reserve Bank of New Zealand (1992).

Figure 1: Inflation in Canada and in the US in the Inflation Targeting Era



Notes: Inflation in Canada is the year-over-year percent change in the CPI (CANSIM v41690914). For the US the series, the CPI for all urban consumers (series CPIAUSL), from the Federal Reserve Bank of St. Louis FRED II data base (research.stlouisfed.org/fred2/) is used.

Figure 2: Varieties of Inflation and Inflation Expectations Indicators for Canada

Notes: Target ranges are from Siklos (2008a). Headline inflation is CPI inflation (see notes to Figure 1). The Consensus forecast is the one-year ahead CPI inflation from Consensus Economics. Long-run inflation expectations (yield curve) are evaluated as the difference between long-term government of Canada bonds (10 years and longer, CANSIM: v122544) and the yield on real return bonds (CANSIM: v122553).

international coordination in the area of banking regulation and supervision,[7] while the growing global interdependence of trading in goods, services, and labour, has also led to more serious attempts by governments to cooperate in designing compatible trade policies. Yet, while international cooperation, if not coordination, in all of these areas is rife, the spread of IT did not take place as the outcome of a concerted global strategy to control inflation.[8] One cannot help but note the stark contrast with the adoption of the Bretton Woods system in the aftermath of World War II, and the search for a monetary anchor of some kind during the stagflation of the 1970s and 1980s, when crises forced a rethink of the international monetary order.

A few countries, including Canada, subsequently adopted a monetary target, but *ex post* this proved to be a brief interlude on the road to the current IT monetary policy strategy.[9] Other countries, most notably in Europe, were still clinging to a form of exchange rate pegging to carry them through to eventual monetary union and the creation of a single currency, the euro.

Throughout this period, as is now well known, macroeconomic conditions were dismal with high inflation and poor economic growth the norm in much of the world. The fear of a return to higher inflation, combined with a slowing economy, remains a possibility. At the very least, a milder version of the 1970s style stagflation may well be in the offing.[10] Even if worries over inflation are now being replaced with fears of the onset of deflation,[11] due to sharply lower commodity prices and a global recession, one should be reminded of the link between the ongoing credit crunch and the resulting supply-side effects. This scenario is also one that can lead to higher, not lower, inflation (Blinder 1987).

The Spread of Inflation Targeting Around the World

As others have noted (e.g., Rose 2007), IT has spread around the world, especially among emerging market economies. Appendix A also provides summary information about some of the key ingredients of IT regimes in a global context. Clearly, there is some diversity in what is targeted, how this is accomplished, and over what horizon the chosen objective is to be attained. It is notable, however, that differences in the range of desirable inflation rates across the globe have diminished considerably since IT was introduced in the industrial world. There is, likewise, little variation in how monetary policy decisions are reached. Instead, there is considerably more diversity in the degree of accountability and disclosure of the monetary policy process (e.g., see Siklos 2002, Chapter 6; Eijffinger and Geraats 2006; Dincer and Eichengreen 2007.) Examination of Dincer and Eichengreen's (2007) index of transparency (not shown) reveals that four of eight IT countries in the industrial world are considerably more transparent than industrial countries that do not explicitly target inflation. Indeed, only the USA and the euro area come close to being as transparent as those economies with quantified objectives. In contrast, transparency among emerging market economies' central banks is considerably lower than at counterpart central banks in the industrial world.

7 Yet another manifestation of these developments is the creation of the Financial Stability Forum.

8 Indeed, as Rose (2007, p. 687) put it: "The system of domestically oriented monetary policy and floating exchange rates and capital mobility was not formally planned. It does not have a central role for the United States, gold, or the International Monetary Fund. In short, it is the diametric opposite of the postwar system: Bretton Woods, reversed."

9 The failure of monetary targeting is chronicled in Bernanke and Mishkin (1992), and is perhaps best remembered for the phrase uttered by former Bank of Canada Governor, Gerald Bouey, when he said: 'we didn't abandon monetary aggregates, they abandoned us.'

10 This fear is perhaps best exemplified by Meltzer (2008).

11 There are both 'good', 'bad', and 'ugly' forms of deflation. The current talk is about the latter kind. See Burdekin and Siklos (2004) and references therein.

There also exist differences in the manner in which the targets are implemented, understood, and how credible they are, features of the IT strategy that continue to be downplayed. Only some of the salient ones are mentioned here.[12] Perhaps the least appreciated feature of such regimes, at least from a global perspective, is the distinction between inflation reduction and inflation-control targets. All industrial countries have operated under unchanging inflation objectives for several years. In contrast, in only roughly half of emerging market economies with quantitative inflation objectives have the target ranges remained fixed for two years or more (also see Siklos 2008a). Some central banks are required to keep inflation within a target range, others must meet a single numerical objective. Still others view the target as a medium-term objective to be met over some ill-defined cycle with minimal, if any, requirements to justify breaches in the inflation objective.

Most central banks target a headline rate of inflation, as measured by consumer prices, although several central banks set their sights on core inflation, or a version of core inflation that excludes certain especially volatile items in a broader price index. One powerful theoretical argument favouring reliance on core inflation is that a credible central bank can then ignore drifts in the price level that are unlikely to be permanently reflected in headline inflation. However, other than the measurement issues involved, and the complex task of distinguishing transitory from permanent shocks affecting inflation, this solution does not deal with the fact that the public is not only more likely to follow movements in headline inflation but ultimately cares primarily about this measure of loss in purchasing power. After all, wages and the real return of financial assets are evaluated on the basis of headline inflation.

Focussing on core rather than headline inflation can be problematic for another reason: the relative importance of volatile elements in headline CPI measures vary considerably around the world. Whereas central banks in the industrial world may arguably be in a better position to explain the relevance of core indicators of inflationary pressures since, for example, food and energy prices represent a somewhat smaller proportion of the overall index, the same is not true for emerging markets economies that are attempting to emulate an IT strategy.

The formality of the IT regime can also vary widely. In some countries, there is legislation that outlines the obligations of both parties to the agreement to target inflation (e.g., as in New Zealand), in others there exists an understanding, not legislated, between the Governor of the central bank and the Minister of Finance about what range of inflation rates is desirable (e.g., as in Australia and Canada). However, observers should not harbour the illusion that politics has anywhere been removed from deciding the remit of a central bank. Ultimately, any monetary policy is dictated by the wishes of a particular government and legislature.

In a few instances, the central bank decides the appropriate inflation objective that is expected to be met over time (e.g., the European Central Bank). While IT may well have created a 'virtuous feedback loop,' with lower and more stable inflation underwritten by the political authorities, this attitude is less well entrenched in non-industrial economies with explicit inflation-control objectives. Several countries, including IT countries in the industrial world, have adopted fiscal rules to constrain the ease with which a deficit, especially of the politically motivated variety, can re-emerge. Nevertheless, it is unclear how binding existing fiscal commitments are, especially as the world economy endures a period of economic stress. For example, Europe's Stability and Growth Pact (SGP) has already been watered down, or is not taken sufficiently seriously (e.g., see Annett, Decressin, and Deppler 2005, and references therein).

In addition, there exist differences in the degree to which central banks are committed to a floating exchange rate, thought by some to be the *sine qua*

12 See, for example, Bernanke, Laubach, Mishkin and Posen (1999), Rose (2007), and Siklos (2002, 2008a).

non of a coherent IT strategy. In times of economic stress, these differences may well matter, especially as in the current international economic environment policymakers have begun to call for more 'flexibility' in their regimes without, of course, spelling out what this means nor what this implies for the existing exchange rate regime.[13]

Has Inflation Targeting Worked?

Still, at the heart of all IT regimes is the core belief that low and stable inflation rates represent a goal that society ought to aspire to. The fact that policymakers and, ultimately, the public can be convinced of the desirability of such a goal stems in no small measure from the emergence of a consensus about the appropriate social utility function that ought to govern a central bank's actions.[14] Simply stated, it was deemed optimal to conduct policy in such a manner as to minimize the variance of inflation and real GDP growth. Eventually, the trade-off between the two, and the policies required to minimize them, became enshrined in what academics and policymakers have come to accept as constituting 'best practice' in the conduct of monetary policy.

The policy has survived the onslaught of repeated banking, financial, and economic crises around the world, and has thrived in spite of, or perhaps because of, the seemingly relentless forces of globalization. Even so, whereas academic research has clearly demonstrated that IT has served us well, there is as yet no conclusive evidence that an explicit IT policy yields superior economic outcomes relative to a monetary policy regime that just 'does it' when it comes to controlling inflation.

The IMF (see IMF 2006) recently sought to place the IT strategy in the most favourable light possible. Yet, a cursory survey of the results of both their study and those of others employing a similar approach (e.g., Hyvonen 2004) suggests that the evidence in favour of IT is inconclusive, mainly, because the metric used to demonstrate the supposed superiority over alternative regimes is flawed, and is likely incapable of providing a definitive answer about the ability of an IT regime to deliver comparatively better inflation performance.[15]

The Secret to Inflation Targeting's Success

I demonstrate below that the likely source of IT's success is that this strategy is better able to anchor inflationary expectations, and delivers the appropriate stance of monetary policy in a more consistent manner.

Consider Figure 3A. I calibrate the eponymous Taylor rule (explained in Appendix B) for a group of five inflation-targeting and five non-IT economies since the early 1990s.[16] They are: Australia, Canada, New Zealand, Sweden and the United Kingdom (IT); and the euro area, the United States, Malaysia,

13 As when the G24 Ministers, in April 2008, suggested that "...emerging markets and developing countries will need flexibility with regard to fiscal and monetary policies to soften the impact of exogenous shocks on their economies." (Intergovernmental Group of 24 2008). In 2007, New Zealand, after abstaining from foreign exchange market intervention for about 15 years, intervened twice. In 2008, the Bank of Korea intervened in order to attempt to use an appreciating currency to offset inflationary pressures. If the past gives any indications, these measures are likely to fail.

14 Taylor (2007) traces this development to the 1970s, when economic research had reached the point where: "...it was hard to find a paper in which the policy objective was not stated."

15 The usual approach is to estimate a regression wherein an inflation differential consisting of inflation in the targeting period less inflation during a sample when targets were not in place is regressed on, among other variables, a dummy that identifies the adoption of IT (e.g., see Ball and Sheridan 2003). Ordinarily estimated in a cross-sectional framework, the test requires that inflation and non-IT regimes be identified. The latter group serves as a control group. In IMF (2006) the control group consists of 29 countries while the IT group consists of only 13 countries (all emerging market countries). Although there is an attempt to check for robustness there is virtually no justification offered for the selection of the control group of countries which is a veritable motley crew of countries with different monetary policy strategies (see IMF 2006, Appendix II), including some countries that would soon go on to adopt an inflation target (e.g., Turkey).

16 The notes to Figures 3 and 4 provide details of the estimation of policy rates consistent with a Taylor rule for IT and non-IT economies.

Singapore, and Switzerland (non-IT). The non-IT group comprise economies that have deliberately eschewed the IT label, have explicitly adopted exchange-rate regimes of the non-floating variety, and include some small open economies that have delivered relatively low and stable inflation rates during the period considered.

Next, I consider how monetary policy is actually conducted in the two groups of economies considered here, again relative to the Taylor rule prescription shown in Figure 3A.[17] The results are shown in Figure 3B. It is clearly seen that actual policy rates in IT economies are set higher than the "standard" Taylor rule would require until about 2000 in both groups considered, but especially among the ITers. Thereafter, policy is consistently loose in the non-IT economies and, at least on average, just about right in the IT camp. Figure 3B, therefore, is another demonstration that differences exist in the actual conduct of monetary policy between IT and non-IT countries that may not be so evident if we only consider *ex post* inflation performance of the economies in question.

If we are prepared to assume that the non-IT group *de facto* behaves as if it targets inflation in the 1-3 percent range, Figure 4 reveals that breaches in the inflation target are significantly smaller among the IT group of countries.[18] In addition, the persistence in policy rate movements is generally higher in IT economies than in the non-IT economies considered, though the gap between the two groups vanishes after 2002 (results not shown). In other words, IT delivers a credibility bonus and greater predictability in nominal interest rate movements.[19] Siklos (2008a) provides further evidence on the international experience with IT.[20] First, when an inflation target is threatened, it is not necessarily the upper range of the target that is breached. Second, when breaches do occur, they are transitory. Rarely do breaches go on beyond two consecutive quarters. It should be noted, however, that since inflation target ranges tend to be more malleable outside the industrial world, the evidence on breaches in emerging market economies is likely biased by giving the impression that they are more successful than they really are. Third, breaches tend to be less variable in both the industrial and emerging market economies than in non-IT economies. Nevertheless, the record of the US, the euro area and Switzerland is comparable to that of any IT economy.

The inflation scare of early 2008 was nothing new. As recently as 2004, policymakers also worried about rising prices. Figure 5 plots one-year-ahead inflation expectations, generally based on professional forecasts, against changes in the policy rates in eight IT and four non-IT central banks since 2004. There are some notable features in the Figure. First, interest rate policies even among IT central banks are quite diverse. Not only is the timing of interest rate changes different across these central banks but the size and even the sign of changes can be quite different. To the extent that there exists a common element in the business-cycle features these industrial economies are facing (see below), this puts paid the notion that all IT central banks think or act alike. For example, during the 2004 inflation scare four of eight IT central banks raised their policy rates. Similarly, half of the non-IT central banks did the same. In the latest inflation scare (2008) five of eight IT central banks raised interest rates while only one of the four other central banks followed suit. Note also that whereas short-term inflationary expectations rose sharply in all non-IT economies, the same signs are apparent so far in only five of eight IT countries shown.

17 A thorny issue, the subject of considerable debate, concerns the measurement of the equilibrium natural rate of interest. A 2 percent assumption for the natural rate incorporated into Taylor's original rule, is likely the most sensible one to work with and, unless there are strong *a priori* reasons to believe that the natural real interest rate is inherently higher in IT economies than elsewhere, the conclusions drawn below will be correct.

18 The mean size of breaches is 0.15 percent in non-IT economies, and 0.06 percent in IT economies. The figures are quarterly at annual rates. The difference is statistically significant (t-statistic = 2.95, significance level =.004).

19 Whether this result reflects the credibility of the IT regime (i.e., policymaking) as opposed to the credibility of monetary policy more generally, is unclear (see Drazen and Masson 1994, who made the distinction).

20 The online technical appendix to this paper contains an updated version of Siklos (2008, Table 1).

Figure 3A: Taylor Rules for Inflation and Non-inflation Targeting Economies

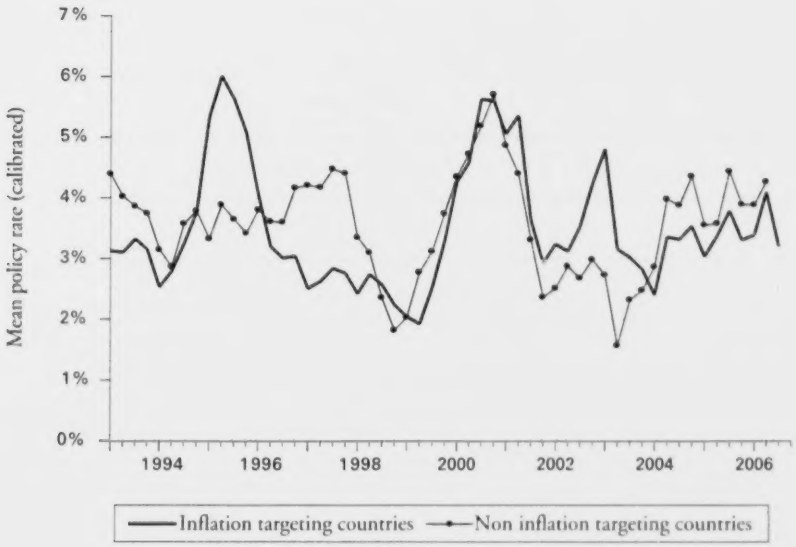


Figure 3B: Monetary Policy Stance in Inflation and Non-Inflation targeting Economies

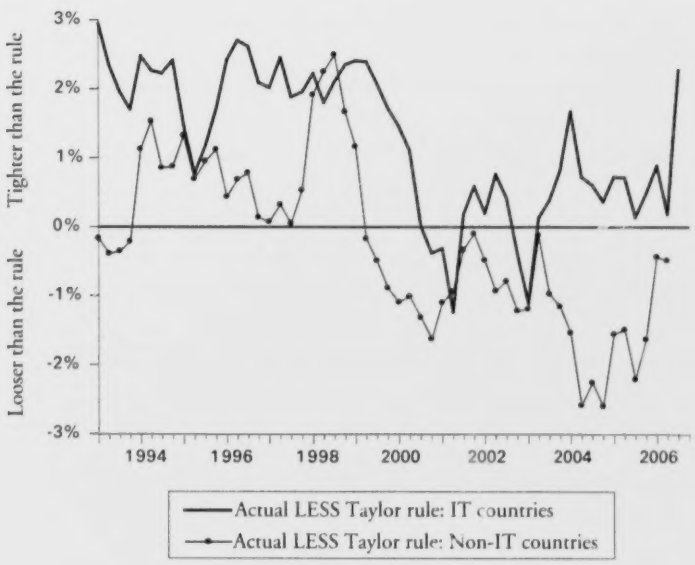
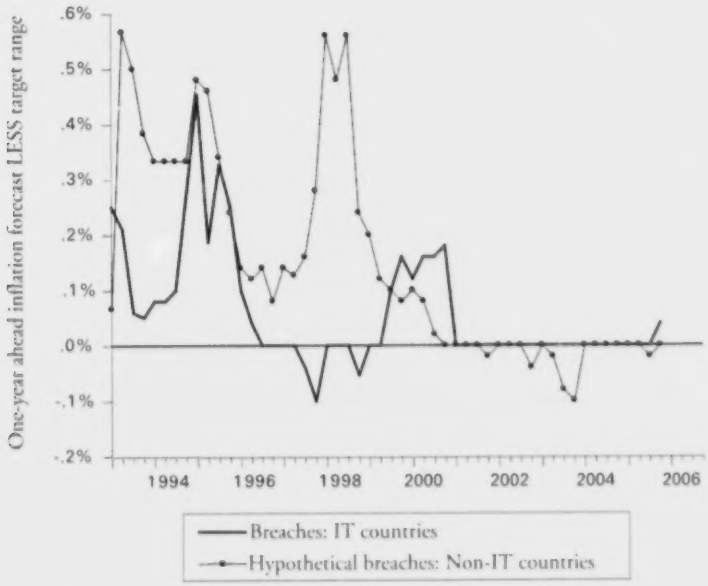


Figure 4: The Anchoring of Inflationary Expectations in Inflation and Non-inflation Targeting Economies



Notes to Figures 3 and 4: Cross-sectional averages of policy rates for inflation and non-inflation targeting economies were applied to a Taylor rule of the form $i_t = 3.5_t + 1.5\pi_t + 0.5y_t^o$ where i_t is the (nominal) policy rate, π_t is the inflation gap (i.e., actual less targeted inflation, y_t^o is the output gap (see Poole (2006) for a discussion of the choice of numerical values). Inflation targeting economies are: Australia, Canada, New Zealand, Sweden, and the UK. Non-inflation targeting economies are: the euro area, the US, Malaysia, Singapore, and Switzerland. Policy rates can be obtained from the web sites of individual country central banks accessible via the Bank of International Settlements' central bank hub (http://www.bis.org). Output gaps were constructed by applying a Hodrick-Prescott filter (smoothing parameter = 1600) to the logarithm of real GDP and evaluating the percent difference relative to the actual (log of) real GDP, with the exception of Canada where its March 2008 estimate of the output gap was used (available from www.bankofcanada.ca/en/rates/index.html#indicators). For the inflation targets, the mid-point of target ranges over time was used. Details can be found in Siklos (2008a). For the non-inflation targeting economies, a 2 percent target was assumed throughout. In Figure 3, breaches were obtained by relying on the one year ahead Consensus forecast of inflation less the top or bottom of the inflation target range. For non-inflation targeting economies, a 1-3 percent target range is assumed.

Clearly, over time important differences in monetary policies emerge that may not be reflected in analyses that focus on inflation performance alone. Tests (not shown, but see the technical Appendix) reveal that business cycles are less synchronous between the non-IT economies and the US than between IT countries and the US, but only after 2003. If 'decoupling,' or, preferably, growing divergences in business cycles between these two sets of countries has emerged, it is a rather recent phenomenon. Unfortunately, these tests are not informative about the role of the IT regime per se in generating this outcome, but the results may help explain the different monetary policy stances reported above, particularly since 2004 (also see Figure 5).

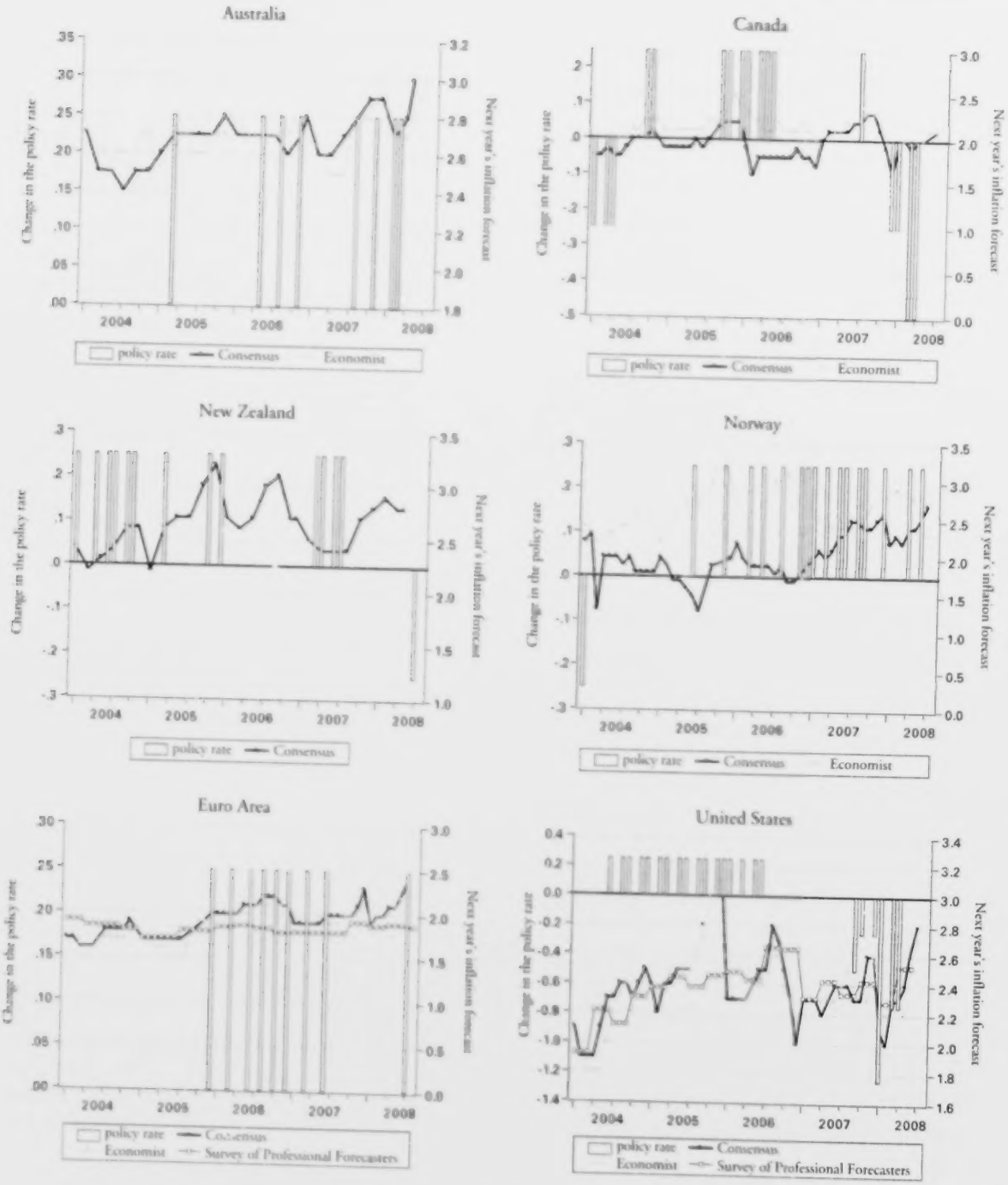
Plus ça Change?

When the Bank of Canada released background information in November 2006 about the renewal of the inflation target (Bank of Canada 2006) what was omitted from the announcement is more interesting than what was listed as being on the agenda for future research.

Revisiting the Bank of Canada's Remit

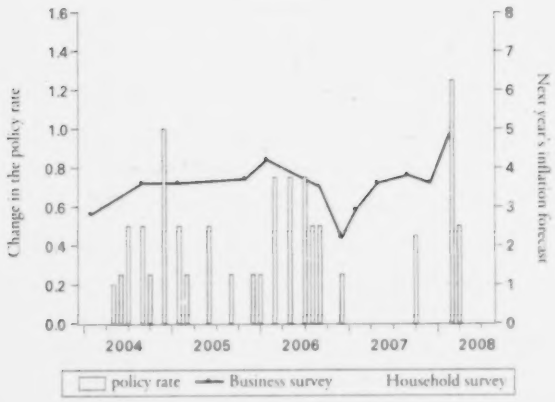
To begin with, and conceivably most importantly, improvements in inflation performance are a worldwide phenomenon. The left-hand-side panel of Figure 6 reveals that, since 1998, inflation performance worldwide has approached the kind

Figure 5: Changes in Policy Rates and Inflation Expectations in Inflation and Select Non-Inflation Targeting Economies

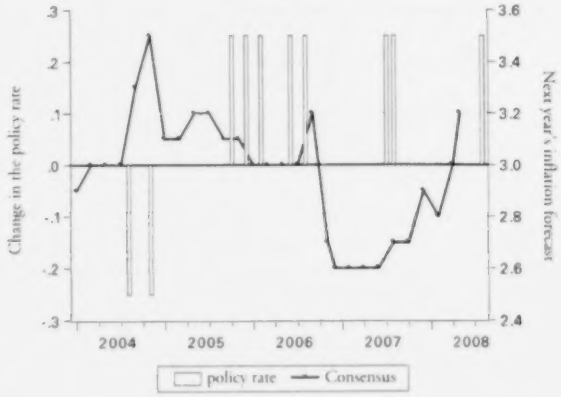


Note: Policy rates are as defined in the technical Appendix, and in Appendix A. All data were obtained from individual central banks. Inflation Expectations are from the sources listed in each Figure above and represent the forecast in the calendar year following the observation shown with the sources provided in each Figure. The only exception is the Survey of Professional Forecasters for the euro area which is the 2 year ahead forecast. Hence, Δi_t is plotted on the left hand scale while various proxies for $E_t \pi_{t+1}$ are shown on the right hand scale, where t is the current calendar year.

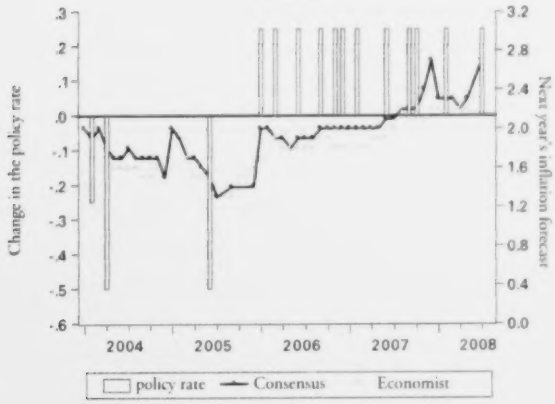
Iceland



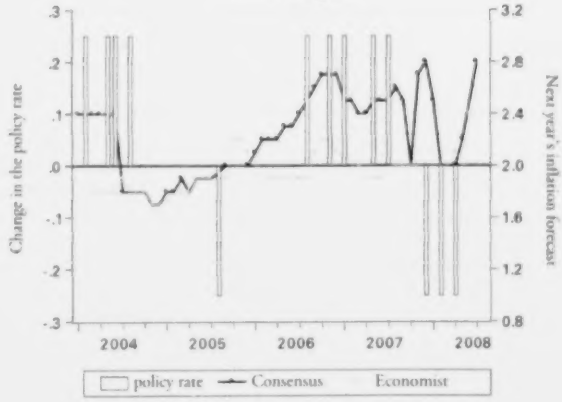
Korea



Sweden



United Kingdom



Japan

Switzerland

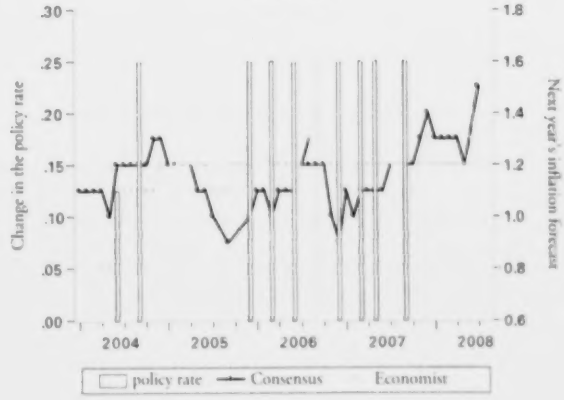
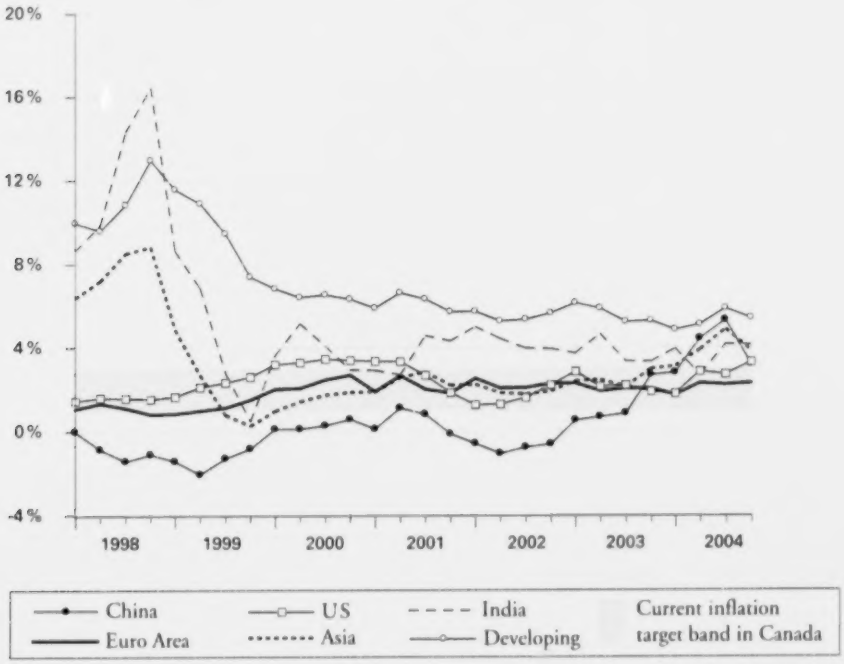
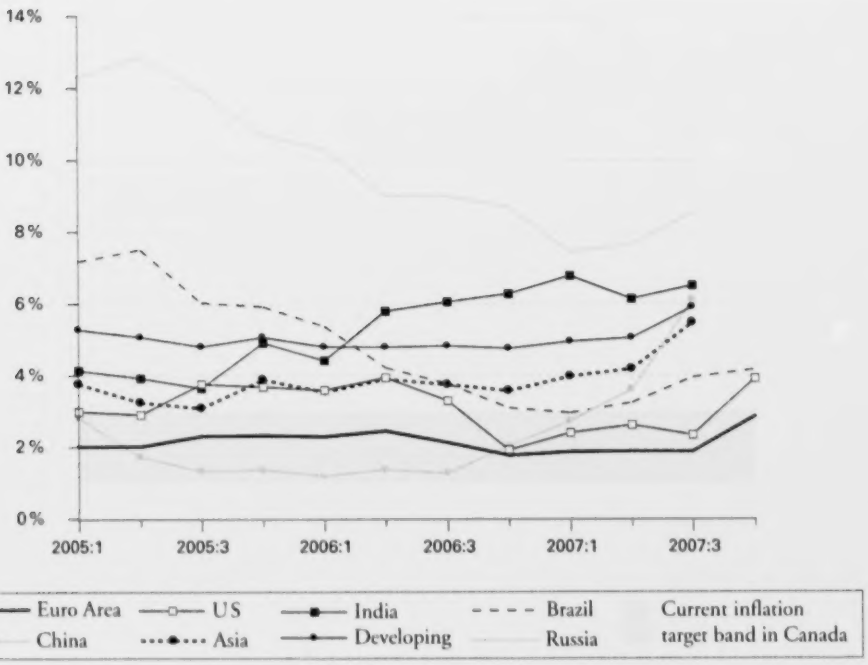


Figure 6: Inflation in Various Regions and Countries Around the World: 1998-2007





Notes: Inflation is the year over year percent change in the CPI or each respective economy. Data are from the February 2008 CD-ROM of the International Monetary Fund's *International Financial Statistics*. Highlighted is a band of 1-3percent, the current inflation target band in Canada.

of inflation-control objectives agreed to between the Bank of Canada and the federal government. Nevertheless, the right-hand-side panel of the same Figure reveals some rather disquieting signs on the inflation front after 2006. Inflation outside Canada rose everywhere.

While the Bank could not have known in 2006 that a surge in global inflation would capture the headlines in 2008, it could have asked more explicitly in its remit how an IT strategy might deal with a 'worst case' scenario when this kind of policy strategy is put to a severe test.

Canadian versus US Monetary Policies

Closely related, the situation as it stood in 2006 emerged as a result of, or was prompted by, a benign worldwide macroeconomic environment, often referred to as the Great Moderation. The reduction in the volatility of inflation and output growth was nothing short of remarkable. Blanchard and Simon (2001) were among the first to bring attention to this phenomenon but their evidence only documents the facts up to the 1990s.

The foregoing developments allowed monetary policy to become expansionary (see below). Figure 7 is an attempt to explain, again relying on the Taylor rule, the evolution of the overnight rate in Canada and in the US since IT began. Depending on how one 'calibrates' the policy rule, monetary policy has, for the most part, been consistent with conditions of monetary ease since 2000 in both countries.[21] Indeed, other than in 1994, and again briefly in 2006, the stance of policy has been similar in both countries. The brief tightening in the US that began in 2006, but was quickly reversed in 2007 with the onset of the sub-prime crisis, explains the divergence in policies towards the end of the sample. On average, monetary policy has been persistently expansionary since inflation targets were introduced in Canada. This result holds even under a variety of assumptions about the evolution of potential output. The combination of a favourable external inflationary environment, together with modest threats to the underlying inflation-control target, suggests that, over the lifetime of the present regime, it may not have been sufficiently stress-tested.

Monetary Policy and Financial Stability

The current bout of financial uncertainty threatens the delicate balance between the Bank of Canada's mandate to "...mitigate by its influence fluctuations in the general level of production, trade, prices, and employment..." (*Bank of Canada Act* (1985), Preamble, c. B-2), and the power vested in the Governor if he is "...of the opinion that there is a severe and unusual stress on the financial market or financial system..." (*Bank of Canada Act* (1985), section 18, g.1). Although we may not yet know the full extent of the fallout from what began as the sub-prime crisis during the summer of 2007, at least Canada does not appear to share the same prospects as the US with regard to a collapsing housing price bubble, certainly in terms of magnitude.

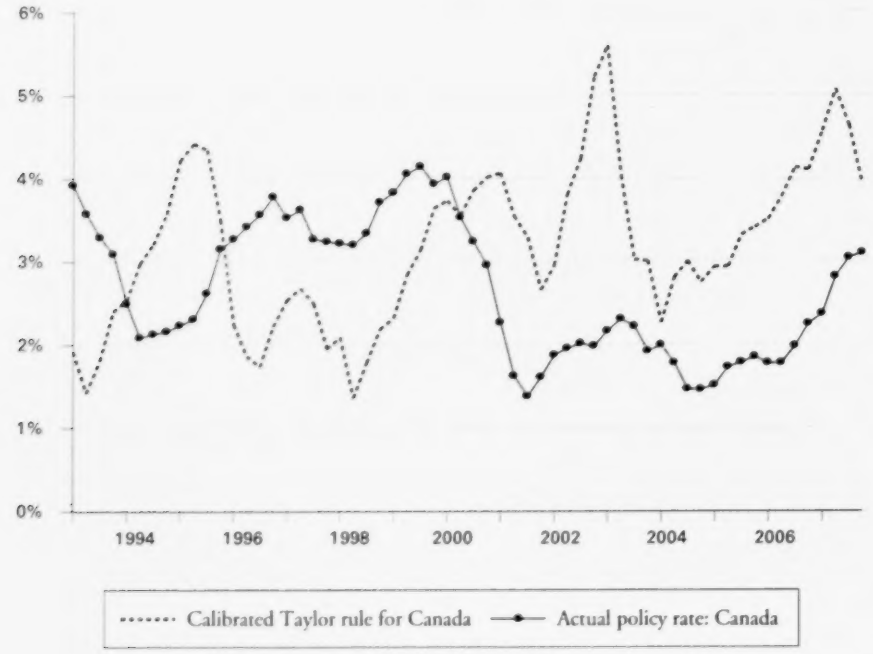
However, as the US Federal Reserve and other major central banks, including the Bank of Canada, continue to struggle with the credit crunch, the asymmetry between the now widely accepted notion that anticipated rises in inflation should be pre-empted, while asset price bubbles should be dealt with retroactively, is glaring.[22] This, in spite of the fact that there exists considerable evidence linking rapidly rising housing and equity prices to subsequent strains in the conduct of monetary policy.[23]

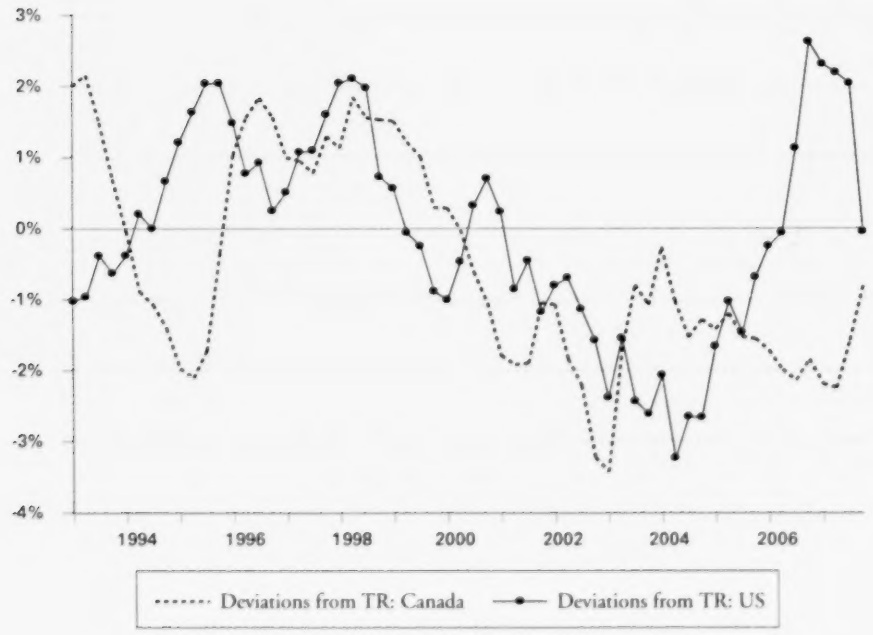
21 Mean deviations from the rule were -0.52 percent for Canada (statistically different from zero), and -0.06 percent. for the US (not significantly different from zero).

22 This attitude is reflected in the views of Alan Greenspan who is sceptical of a central bank's ability to pre-empt an asset price bubble but never does entirely rule out an activist policy in this regard. "But how do we know when irrational exuberance has unduly escalated asset values, which then become subject to unexpected and prolonged contractions, as they have in Japan over the past decade? And how do we factor that assessment into monetary policy? We as central bankers need not be concerned if a collapsing financial asset bubble does not threaten to impair the real economy, ...But we should not underestimate, or become complacent about, the complexity of the interactions of asset markets and the economy." (Greenspan 2007, p. 177) The Fed, under Bernanke, may well have reconsidered Greenspan's stance (Lahart 2008).

23 See, inter alia, Borio and Lowe (2002), Bean (2003), Detken and Smets (2004), and Siklos and Bohl (2008). For an excellent overview of the case for more activist policy in the face of large asset price movements, see Roubini (2006).

Figure 7: Monetary Policy Rules in Canada and a US-Canada Comparison





Notes: Also see notes to Figures 3 and 4 for definitions and the Taylor rule specification. The Canadian Taylor rule uses the CPI and the March 2008 estimates of the output gap. The US Taylor rule uses the PCE deflator and the Congressional Budget Office's output gap estimates and the weights as used by Poole (2006).

Indeed, the failure to pre-empt the asset price bubble associated with the high-tech sector in 1999, and current attempts to deal with the collapse of the US real estate market after the fact, have led to accusations that the manner in which central banks react to asset price movements results in overly loose monetary policy that will eventually generate high inflation. Whether rolling bubbles stem from monetary policy relaxing its emphasis on price stability remains in question. Indeed, the discussion has highlighted what used to be referred to as the limits of monetary policy, a term that is no longer frequently heard from the lips of central bankers. Policymakers are asking, once again, what role a central bank has in supervising and regulating banks and other types of financial institutions, a topic that is beyond the scope of this *Commentary*.

Blinder (2008) points out that no central bank has a set of instruments that can target a stock market bubble that, as in the case of the tech bubble of 2000, tends to be centered in a segment of the stock market. Bubbles that stem from irresponsible bank lending practices, however, are another matter because the central bank and bank supervisors, if they are separate institutions, do have the information and the ability to step in before the damage is done. Blinder is correct but only up to a point. More importantly, his arguments do not diminish the case for more activism by central banks in the face of run-ups in asset prices. Even if stock market bubbles are confined to a particular segment of the market, their impact spills over to other prices and other markets elsewhere. Moreover, if the existing empirical evidence suggests that equity price bubbles are economically less harmful than housing price bubbles, this does not absolve the central bank from communicating its concerns over the direction of change in selected asset prices. Using an interest rate instrument to temper stock price increases can still be the appropriate response.

The Bank of Canada, therefore, could be more explicit in stating how it might pre-empt the consequences of stresses in the economy and the financial system in particular and avoid the accusation levelled at some central banks that they are effective enablers of asset price bubbles. While this is certainly not easy, the attempt ought to be worthwhile. Filardo (2008), for example, highlights the benefits of a more activist central bank in relation to large asset price movements. Borio and Shim (2007) also make the case that central banks can be effective in mitigating asset price movements.

Defining Price Stability

It is worth noting that the answer to the question "what is meant by the term price stability?" has been postponed since at least 1990. Former Governor John Crow attached a great deal of importance to this issue. The official announcement of what was then referred to as inflation reduction targets explicitly pointed out that Bank of Canada research "...suggests a rate of increase in consumer prices that is clearly below 2 per cent. However, a more precise definition is not specified now – in the event that further evidence and analysis relevant to this matter become available in the next few years." (Crow 2002, p. 178) Almost two decades later, we still wait for a precise definition. The 2006 Bank of Canada background paper announcing the renewal of IT until 2011 no longer refers to a desire to define price stability the next time around the targets are slated for renewal. One possibility is that the current target of 2 percent essentially amounts to a consensus view about what price stability represents. However, a formal statement from the Bank indicating that 2 percent headline inflation is tantamount to price stability has never been forthcoming.[24] Instead, the Bank prefers to frame the question as asking "...whether the specific regime established in the 1990s will deliver the greatest contribution that monetary policy can make to economic performance and to

24 The Bank defines price stability in the following terms: "A situation where inflation is low enough so that it no longer affects people's economic decisions is referred to as price stability." From http://www.bankofcanada.ca/en/backgrounders/bg-i1.html.

the well-being of Canadians in the decades ahead." (Bank of Canada 2006, p. 3).[25] Interestingly, the European Central Bank appears to have settled this issue. The definition of price stability it has set for itself is "...as a year-on-year increase in the Harmonized Index of Consumer Prices for the euro area of below 2 percent."[26]

We've Seen this Movie Before

Rose (2007) is one of many authors celebrating the successes of IT. In Siklos (2002), I pointed out that IT was about to surpass the Bretton Woods system in terms of longevity. Rose's work adds formal empirical evidence as well as confirming the longevity of the IT regime. Nevertheless, there are signs that this policy is already being put to a more severe test. This has led to some prominent economists, including Joseph Stiglitz (2008), to argue that: "Today, inflation targeting is being put to the test and it will almost certainly fail." Friedman (2004, p. 130) is even more emphatic about the drawbacks of IT regimes, referring to the policy as "...a framework not for communicating the central bank's goals but for obscuring them...." He is especially critical of IT central banks' unwillingness to be explicit about output performance under various inflation projections, and about not being sufficiently open concerning the weight attached on the output gap in the conduct of policy. The first criticism is well taken though Friedman's opinion applies to fewer and fewer IT central banks. The second criticism also contains an element of truth but Friedman never explains what is gained from knowing the weight of the output gap in advance of setting the policy instrument.[27] More importantly, we are never told whether alternative monetary policy strategies can deliver better policy or economic outcomes than IT.

Threats to the Inflation-Targeting Strategy: Complacency and Political Pressure

The financial crisis that has unfolded since the summer of 2007 risks sidetracking central banks away from their principal mission for a number of different reasons.[28] First, while it is true, as Rose asserts, that no country has been forced to abandon IT, there are obvious signs of serious difficulties with the targeting regime in various parts of the world.

In the UK where IT was introduced soon after the policy was enacted in New Zealand and in Canada, the Governor, in 2008, was required for the first time since IT was introduced to explain, in a letter to the Chancellor, why the inflation target was breached and to provide an explanation and the timing of the steps that would be necessary to return inflation back to target.

In Thailand the breaching of the target in 2008, and the central bank's attempts to even modestly raise interest rates to counter inflationary pressures, led to political pressure on the Bank of Thailand (e.g., see Minder 2008). Consider also the example of Iceland where the targets were introduced in 2001. The tolerance range was considerably wider until 2003 when the current range of ±1 ½ percent was fixed. In spite of the generous margins for error, the upper range of the target was breached

25 Although some (Kamenik et al. 2008) contend that the Bank of Canada has, in effect, been operating as if it followed a price level target, albeit with a 2 percent annual drift, how the Bank of Canada has convinced the public to hold expected inflation at that level is not spelled out. Moreover, if 2 percent is indeed akin to price stability this opinion would have to be publicly announced and supported by the government which ought to have final say on such a definition.

26 The Maastricht Treaty mandates the ECB to achieve price stability. See www.ecb.int/mopo/strategy/pricestab/html/inde.en.html. Note that the ECB, since its creation, has yet to meet its own objective in a consistent fashion. Hetzel (2008, Chapter 15) describes how the FOMC, and Greenspan in particular, concluded, around 1996, that 2 percent was an inflation target for the US consistent with price stability.

27 Lars Svensson, currently Deputy-Governor of the Swedish Riksbank, has argued that central banks ought to reveal the parameter values in their loss function. So far, no central bank has followed this strategy.

28 Saunders (2008), who reviews the forces at play in the early stages of global efforts aimed at preventing a recurrence of the recent financial crisis, writes: "The idea that central banks can quietly stick to keeping inflation at bay is gone." Fortunately, some central bankers, such as Jean-Claude Trichet, President of the ECB, beg to differ: "The primary goal of a central banker and certainly of the ECB is to maintain price stability..., which is a necessary condition for financial stability, if not a sufficient condition." (Trichet 2008).

almost half the time since the inflation objectives were put in place (12 of 28 quarters). One culprit: the phenomenal gr vth in the foreign debt to GDP ratio, which led to the collapse of the currency. This raises a question that has lately often been left out of the IT debate, namely the extent to which fiscal or debt considerations can jeopardize an inflation objective.

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Will Inflation Targeting Continue to Spread?

In spite of the current Fed Chairman's sympathy towards IT, the US is no closer to adopting this type of monetary policy strategy than when Alan Greenspan stood steadfastly against adopting formal inflation targets. Similarly, there are no signs that the European Central Bank will anytime soon admit to conducting policy as if it were explicitly targeting inflation.

Moreover, as Rose's own work also make clear (also, see IMF 2006), the rising popularity of IT largely comes from its spread into emerging market economies. Not only is their historical commitment to low and stable inflation more suspect but the success of IT is frequently tinged by the not-so-infrequent resort to moving the targets. Hence, the durability of these regimes is very much open to debate.[29]

Only a relatively small number of countries have stable inflation-target ranges of the kind the Bank of Canada has had to abide by since 1995. Therefore, there are plenty of reasons not to be too self-congratulatory about the wonders of an IT regime.[30] Rather than IT per se, a more important consideration is commitment to a price stability objective. In so far as an explicit inflation target facilitates the communication of how monetary policy is actually implemented, and the variables under which a monetary policy is conditioned, this type of regime ought to be preferred over ones that effectively amount to simply declaring a quantitative target only.

All Together Now?

Finally, while the floating exchange rate regime and central bank independence rule the day, a change in this policy environment is not out of the question. Indeed, several IT central banks reserve the right and continue to engage regularly in foreign exchange market intervention (see Appendix A). So-called trends in one direction can easily be reversed and there are plenty of historical precedents to draw upon that justify this position, as illustrated previously.

It was pointed out earlier that IT has enjoyed widespread appeal because of a growing consensus that price stability is a desirable objective, and that an explicit numerical inflation objective may well be a critical ingredient in credibly achieving this result. As such, policymakers around the world have independently arrived at what Taylor (2007a) refers to as a 'global cooperation policy.' This refers to the recognition, reached more or less independently by countries in several parts of the world, that 'best practice' in monetary policy involves responding to inflation and output shocks following a Taylor rule, in its classic form.

29 As this is written, inflation in South Africa has been outside the generous 3-6 percent target band for about a year with no signs of an immediate let up in inflation that recently reached double digits (http://www.reservebank.co.za/; go to Media releases & statements). Similarly, a relative newcomer to IT, Turkey, has so far yet to achieve its inflation target necessitating explanatory statements from the Governor (e.g., see the Governor's April 30, 2008 statement available at http://www.tcmb.gov.tr/eni/eng/) and a revision to its inflation-control path.

30 Hopefully, the publication of Rose's findings is not the manifestation of Goodhart's law ("Any observed statistical regularity will tend to collapse once pressure is placed on it for control purposes," Goodhart (1984, p.96). In the present context, this would seem to imply the pending unraveling of IT as a monetary policy strategy.

Indeed, empirical evidence is available to support the contention that, so long as different countries adopt a comparable monetary policy strategy, summarized by adherence to a Taylor rule, there is no particular advantage in terms of policy outcomes in separately reacting to the exchange rate.[31] The reason is straightforward. A central bank that nominally cares only about inflation and the output gap but, in practice, takes into account the conduct of monetary policy in the rest of the world, effectively acts as if it also responds to the exchange rate.

Taylor suggests that directly responding to exchange rate developments may be one of the by-products of globalization, in so far as the latter presents a temptation to veer off course from following a policy rule that focuses on responding only to inflation and output gaps. This approach effectively leads to a deterioration of a framework that, in his opinion, has worked well for almost two decades. Interestingly, he does not invoke the role of formal IT, as practiced in countries such as Canada, except to point out that, in emerging markets where this strategy has been employed, there has been a tendency to react to exchange rate movements.[32] Apparently, this can be destabilizing.

It is important, however, to draw a distinction, not raised in Taylor (2007a), between a central bank that explicitly pays attention to the nominal exchange rate as a complementary objective of monetary policy versus a monetary policy that recognizes that exchange rate movements may not reflect 'fundamentals' at every moment in time and, therefore, appears as if to react to the monetary policy of the centre (i.e., the US or the euro area).

Alternatively, interest rate smoothing, a widely recognized stylized fact of interest rate movements can also give the appearance of a policy reaction function that seemingly reacts to exchange rate movements. But this need not be destabilizing. Such practices are potentially destabilizing only when an explicit and direct role is given to the exchange rate in the setting of the policy rate.[33]

What Role for Monetary Policy Coordination?

Table 1 shows regression evidence suggesting that exchange rate considerations do matter in a wide variety of countries, whether they explicitly target inflation or not. That this feature of the data indicates a threat to good conduct in monetary policy is unclear for reasons just outlined. Of course, the foregoing deals with the first moment in exchange rate movements (i.e., the mean). There is still the open question concerning whether second moments (i.e., volatility) can indeed have a deleterious impact on economic performance. Nevertheless, as pointed out by Mishkin and Savastano (2000), there ought to be no confusion about exchange rate considerations, so long as the primacy of the inflation objective is upheld.

Taylor's conclusions about the benefits of following a monetary policy strategy based on no more than on a common understanding of how to set the domestic policy instrument may, however, be overly optimistic for other reasons as well. Coenen et. al. (2008) demonstrate that the net benefits of a go-it-alone approach, wherein the central bank is oblivious to the policy rule of other countries, is highly sensitive to the degree of

31 Collins and Siklos (2004) estimate optimal rules derived from the standard quadratic loss function of the central banker and find that even in very open economies such as Australia, Canada, and New Zealand, explicit concern for the exchange rate does not improve policy outcomes. Paralleling this result is the conclusion reached by Clarida (2001) that the classic Taylor rule works just as well for a small open economy as it does for large economies such as the US.

32 Nor does he point out that some exchange rate movements stem from changes in demand, as reflected, say, in rising commodity prices which then translate into an appreciation. Alternatively, exchange rate movements can reflect portfolio shifts such as when markets favour assets denominated in a particular currency (e.g., the U.S. dollar). The Bank of Canada has referred to this distinction as type One and type Two exchange rate movements. See Dodge (2005).

33 The archetypical example perhaps of this phenomenon took place when the Reserve Bank of New Zealand promoted the Monetary Conditions Index (Canada flirted with this strategy but without the same degree of commitment). See Siklos (2000).

Table 1: Monetary Policy in a Cross-Section of Countries and Policy Sensitivity to the Exchange Rate

Country	No. of Quarters	Mean Deviation	Coefficient on Fed funds rate
Industrial			
Australia	51	2.04 (1.97)*	0.46 (.00
Canada	52	-0.48 (1.92)	-0.05 (.44)
			/0.18(.00)
Korea	31	2.41 (5.00)*	0.85 (.00)
New Zealand	52	1.53 (1.30)*	0.35 (.00)
Norway	52	0.36 (2.60)	-0.09 (.29)
Sweden	52	1.96 (1.83)*	0.51 (.00)
United Kingdom	35	1.44 (1.40)*	0.41 (.00)
Iceland	20	3.78 (3.09)*	1.59 (.00)
Emerging			
Brazil	27	11.04 (5.69)*	3.00 (.00)
Chile	24	2.00 (2.78)*	0.72 (.00)
Colombia	26	5.91 (5.94)*	0.72 (.00)
Mexico	28	3.75 (2.66)*	1.13 (.00)
Peru	16	0.51 (2.58)	0.23 (.47)
South Africa	24	4.93 (3.23)*	1.09 (.00)
Czech Republic	32	2.64 (3.16)*	0.63 (.00)
Hungary	20	3.15 (1.91)*	0.87 (.00)
Poland	29	11.32 (5.71)*	2.98 (.00)
Israel	52	6.51 (4.23)*	1.57 (.00)
Philippines	16	3.83 (3.29)*	1.35 (.02)
Thailand	23	-2.33 (2.26)*	-0.54 (.00)
Indonesia	24	3.04 (4.95)*	0.88 (.01)
Non-Inflation Targeting			
US	52	-0.33 (1.71)	-
Euro area	48	0.18 (1.02)	0.11 (.00)
Switzerland	24	-0.60 (0.68)*	-0.12 (.02)
Japan	52	-0.12 (1.42)	-0.05 (.32)
Argentina	47	3.65 (15.29)*	1.03 (.04)
Malaysia	47	-0.08 (1.43)	-0.03 (.52)
Singapore	47	0.40 (2.41)	0.07 (.41)
Hong Kong	47	1.41 (6.94)	0.17 (.48)
Slovenia	47	-3.51 (3.08)	-0.78 (.00)

Note: A Taylor rule (see Notes to Figures 2 and 3) was fitted to each country's data, including the US. The difference between the two Taylor rule estimates are regressed on the US Fed funds rate (no constant term). Also, see Taylor (2007).

openness of an economy and the degree to which the economies eyeing each other are integrated. There may well be advantages to conditioning one's monetary policy on the policy of another country, especially if it is a large trading partner.

Furthermmore, the US dollar plays a dominant role in international transactions and this feature of the international economy may provide an explanation for asymmetric pass-through effects. Clearly, this issue is also relevant to the apparent success of a made-in-Canada monetary policy strategy. It is well known that while pass-through effects were weak to non-existent when the Canadian dollar was depreciating in the early years of the new century, stronger pass-through effects in the recent run-up of the currency may provide clues as to why inflationary pressures in Canada have, so far, been moderate. Exactly why these forces appear to operate differently in some countries, such as Australia, New Zealand, or even the euro area, is never actually spelled out. Therefore, despite Taylor's (2007a) contention that a commitment to low and stable inflation is enough to mitigate pass-through effects, doubts remain. It may well be sensible to appear to react to the exchange rate even as the focus remains on price stability.

Models that recognize the special role played by a dominant currency in international trade (e.g., see Golderg and Tille 2008, and references therein) imply that there are externalities resulting from how monetary policy is carried out by a dominant economy and that, under plausible conditions, substantial gains in cooperation between the center (i.e., the US) and the periphery (e.g., a small open economy such as Canada's) can be exploited. Hence, the presence of a currency with a significant international role should, in theory, influence monetary policy strategy in periphery countries. Nevertheless, the models used to address these questions are in their infancy and, so far, their ability to explain exchange rate movements, is rather limited (e.g., see Jung 2007).

What all this means is that there is no cut-and-dry answer to the dilemma concerning the role of the exchange rate in a policy rule under IT. Economies that are accused by Taylor of being on the wrong path because they evince a concern for the exchange rate are in regions of the world that, at least according to some, have managed so far to avoid the repercussions of the ongoing economic trials and tribulations under way in the US. Theory has not yet sufficiently progressed to provide a clear answer about how much international monetary policy coordination is desirable. Perhaps cooperation, that is, the exchange of information and experiences, is enough. Equally important, as previously argued, the details of an IT strategy vary considerably around the world. The importance attached to price stability in Canada, together with our attachment to a freely floating exchange rate, sets us apart from many IT economies, certainly outside the industrial world but also vis-à-vis some within the group of industrialized economies. It is comforting that such policies appear to confer a "good housekeeping seal of approval" as well as finding some support in the data.

Quo Vadis?

Even if the present global financial turbulence fades away, and central banks can return to focusing primarily on the job of ensuring price stability, its repercussions have already been felt in Canada. Moreover, the return of a Democrat to the White House may very well signal economic policies that are less friendly to other countries. The question is whether central banks, especially in the industrial world, can withstand political pressure.[34] As Woolley (1984) pointed out some time ago, Arthur Burns, a predecessor of Greenspan at the US Federal Reserve, was one of the world's most respected economists but the Great Inflation of the 1970s happened anyway. Hence, central bankers cannot be entirely immune

34 Or, as one business commentator put it (Stein 2008): "Central bankers can talk the talk. Can they walk the walk?"

to political pressure. However, unlike the 1970s and early 1980s, their toolkit now includes more autonomy, more effective monetary policy instruments, and the fruits of more than a decade's worth of low and stable inflation. In spite of all these advances, the age old habit of politicians applying pressure on the central bank has not yet been outlawed. Nor has the conundrum been solved of what mix of interest rate changes and moral suasion is most likely to deliver the best monetary policy outcomes. An understanding of the distinction between monetary policy actions that are fundamentally credible from ones that are not continues to elude policymakers.

Large movements in the exchange rate, and the reemergence of higher inflation, fuelled largely by global considerations, will further put pressure on policymakers to eye each other's monetary policies to a greater extent than has been the case for the past decade. Since cooperation, if not coordination, in trade, banking, and financial policies, has been on the rise, at least until recently, it comes as a bit of a surprise that there have been fewer efforts to do the same in the sphere of monetary policy. While Canada's monetary policy regime has systematically delivered consistently low inflation in an era of stable economic growth this era may very well have come to an end.

Accordingly, regardless of the fact that the current targeting agreement expires in 2011, this is a good time to reconsider the regime's configuration. Perhaps the principal lesson for the Bank of Canada as it does this is to take careful account of the international environment in which it has been and will be operating. The Bank's failure to emphasize international matters in 2006, when it set out its remit for reviewing the program was, in this author's view, a serious omission and it is to be hoped that they will, in fact, play an important role in its deliberations.

As this paper has argued, international considerations are relevant for two reasons. First of all, they provide a critical source of evidence on how inflation targeting functions, for the simple reason that Canada is only one of about 30 countries that have such a regime in place in one form or another. Furthermore, their configurations differ markedly across specific programs, and experience with them has also been widely varied. As we have seen, the fact that no country that has adopted inflation targeting has then abandoned the regime, save for Finland and Spain which did so upon adopting the Euro, has been widely read as a strong sign of the basic idea's strength. But as we have also seen, closer inspection of the evidence suggests that it is sometimes hard to identify specific benefits that have accrued to countries with a formal inflation targeting regime in place that were not also reaped by other countries – provided that their monetary authorities have displayed a credible commitment to price stability more generally.

Closely related, inflation targeting spread internationally during a period in which the world economy was experiencing a period of stability often referred to as the Great Moderation. Perhaps the spread of inflation targeting itself contributed to this phenomenon, but decisive empirical evidence to this effect has proved elusive, and in any event, the collapse of this moderation into financial crisis and severe recession in the last year or two makes it hard to be complacent on this front. The moral here is not that the unprecedented stability that Canada enjoyed for 15 years or so was unrelated to its inflation targeting regime after all. But it does at the very least suggest that we should be cautious about claiming too much here, and hence in relying too heavily on a renewed program to deliver such a happy experience in the future. Other factors have been, and are likely to remain important, and a further careful study of international experience might help reveal just what these are, what their significance is, and what other aspects of Canadian policy might do about them.

And if the success of inflation targeting in Canada has depended on other aspects of the domestic policy environment, this study has argued that there are also good reasons to believe that factors originating abroad can, do, and will affect its performance. Domestic monetary policies in economies linked by trade and capital markets do interact with one another, and their local effects are influenced by what is happening abroad. Though, as we have seen, there are strong arguments that suggest that inflation targeting policies, each adopted for purely domestic reasons and aimed at local goals in fact reinforce one another across national boundaries and produce desirable outcomes, we have also seen that there are theoretical arguments to suggest that even better results can be obtained by active policy co-operation or even outright co-ordination. Though the pursuit of domestic inflation targets is surely made simpler for policymakers if they ignore their currency's exchange rate with that of their major trading partners, it is still perhaps possible that its degree of success cannot be enhanced if the extra complexities associated with incorporating the exchange rate into policy decisions can be mastered. The same goes for the behaviour of asset prices more generally, a particularly pressing consideration in the light of the recent worldwide disruptions that have emanated from those markets. And here too, given the high degree of international integration of such markets, the best response to such issues for one inflation targeting country is unlikely to be independent of measures taken elsewhere. Questions about international cooperation, and perhaps outright policy co-ordination arise once more.

The point of all this, and indeed of this paper in general, is not to offer particular answers to these questions, but it is to argue that they must be addressed and answered explicitly as part of the process leading up to the renewal of Canada's monetary policy regime in 2011. Perhaps, then, the debate up to now has been just a little too parochial for comfort, and perhaps this essay will help to broaden it in a constructive way.

Appendix A: The Essential Characteristics of Inflation Targeting

Central bankers of all stripes insist that low and stable inflation is desirable. Therefore, at the most general level, it is unclear what is so special about central banks whose monetary policy strategy carries the label inflation targeting. First, and foremost, central banks in this category are distinguished from others by virtue of the fact that they publicly announce a numerical objective for inflation. The Table below shows which countries, in both the industrial world and in emerging markets, announced such targets in 2008.[35]

Most inflation-targeting central banks actually target the mid-point of a range that is either a zone of tolerance or comfort in view of the fact that there are always shocks to prices that are transitory in nature. Therefore, the degree to which an individual inflation-targeting central bank is happy to allow actual inflation to fluctuate away from the mid-mid-point of any range also varies. Second, by publicly announcing such an objective, normally with the active consent of government, these central banks are expected to be relatively more accountable and transparent than their counterparts; although this is, strictly speaking, not always true as central banks that endorse a variety of monetary policy strategies not referred to as inflation targeting have also become more transparent over the last few years, as the Figure A1 below reveals.

In any event, the fact that an inflation rate over some future horizon is being targeted means that the onus is on the central bank to be forward looking, ordinarily by providing either its own forecast or information about the economy's outlook. Beyond these essential characteristics a closer look at how inflation targeting is organized worldwide reveals a surprising amount of diversity.

For example, some central banks focus their policy on the behaviour of a core measure of inflation although the vast majority follows an objective that is expressed in terms of a headline measure of inflation. Most inflation targeting central banks make decisions in a committee setting but the precise manner these committees are structured, their size, voting procedures, the release information about their deliberations, and how accountable they are for their decisions can vary widely.[36] Again, the Table below provides some of the relevant information. For example, at the Bank of England, individual members of the Monetary Policy Committee are accountable and the Chair (i.e., the Governor) makes the motion which is then voted on. In many central banks there is no government representative on the committee while at other central banks (e.g., Australia, Japan) there is a representative present for the deliberations (normally, non-voting). At still other central banks (e.g., Canada) there is no committee structure in Statutes and, while the Governor is accountable for the monetary policy decision, a committee exists to provide advice. Beyond the committee structure there exists a wide variety of arrangements that define the remit of the central bank to deliver a specified inflation objective. For example, the Bank of Canada's target is reviewed every five years, the Reserve Bank of New Zealand negotiates a new remit following each election. In the UK, the Chancellor instructs the Bank of England to meet a certain objective though there is, of course, consultation with the Governor before

35 A separate appendix traces the evolution of such quantified objective around the world since inflation targeting was first introduced in New Zealand in 1990.

36 It is sometimes thought that the committee structure is the natural outcome of the desire for inflation targeting central banks to be both more accountable to the public as well as demonstrating the need for careful deliberation and thought in rendering monetary policy decisions. While there is some truth in this one must, however, remember, that the US Federal Reserve has long operated through the committee structure in part for historical reasons (Meltzer 2002). Similar political considerations led to the creation of a committee structure for the European Central Bank. Neither of these two major central banks target inflation.

any announcement is made. In still other countries the target is reviewed or renewed on a more ad hoc basis.

Other differences between central banks emerge when we consider the horizon over which their policies are supposed to keep inflation in check. Whereas there is a rough consensus around the view that changes in the stance of monetary policy take about two years to work their way through an economy's transmission mechanism many central banks rely on the 'medium-term' or 'over the cycle' as a means of communicating their opinion about over what period monetary policy will influence inflation in the desired direction. Finally, whereas it is now common for inflation targeting central banks to rely on an interest rate instrument there are some subtle differences across countries about the precise mechanism used to influence interest rates no doubt in part because of differences in the maturity and structure of financial markets. Nevertheless, of greater interest is the degree to which inflation targeting central banks foreswear any reliance on intervention in foreign exchange markets. At the risk of over-simplifying, inflation targeting central banks in the industrial world are by far the most reluctant to wield this instrument while monetary authorities in emerging markets tend more openly make clear that the buying and selling of foreign exchange remains part of the toolkit in the conduct of monetary policy.[37]

37 Nevertheless, it proves difficult to ascertain whether the objective if any foreign exchange market intervention is to moderate fluctuations in the exchange rate level, reduce uncertainty about foreign exchange rates, or as means to accomplish an inflation objective without having to change the policy rate. These difficulties contribute to lessen the transparency of many central banks in emerging markets relative to ones in much of the industrial world.

Table A1: Inflation Targeting Around the World

Country	Start Date	Target Range (2008)	What is Targeted?	Principal Instrument(s)?	Policy Horizon?	How Are Decisions Made?
Industrial Economies						
Australia	93.2	2-3	CPI	Cash rate[1]	Over the cycle	Committee
Canada	91.1	1-3	CPI	Overnight rate[1]	Over 6 to 8 quarters	Committee $
Iceland	01.1	1-4	CPI	Repo rate	None specified – as close to target as possible	Governor
Korea	98.2	2.5-3.5	CPI	Overnight call rate (+FOREX)	3 years	Committee
New Zealand	90.1	1.3	CPI*	Cash rate[1]	Over the medium term	Governor $
Norway	01.1	2.5	CPI	Rate on bank deposits in Norges Bank[1]	Over the medium term	Committee
Sweden	93.1	1-3	CPI	Repo rate	None specified	Committee
United Kingdom	92.4	1-3	CPI**	Bank rate	2 years	Committee
Emerging Markets						
Brazil	99.2	2.5-6.5	CPI§	SELIC-overnight interbank loans	Flexible – depending on circumstances	Committee
Chile	90.3	2-4	CPI	Monetary policy interest rate (+FOREX)	2 years	Committee
Colombia	99.3	3.5-4.5	CPI	Central bank intervention rate (+FOREX)	None specified	Committee
Mexico	99.1	2-4	CPI	Overnight bank rate[2]	None specified	Committee
Peru	02.1	1-3	CPI	Reference rate for interbank lending (+FOREX)	None specified	Committee
South Africa	00.1	3-6	CPIX+	Repo rate	None specified	Committee
Czech R.	98.1	1-3	CPI	Repo rate (+FOREX)	Medium term horizon[4]	Committee
Hungary	01.1	2-4	CPI	Base rate[3]	Medium term	Committee
Poland	98.4	1.5-3.5	CPI	Reference rate (+FOREX)	None specified[4]	Committee
Israel	92.1	1-3	CPI	BOI interest rate (+FOREX)	None specified	Committee
Philippines	02.1	3-5	CPI	Repo rate	2 years	Committee
Thailand	00.2	0-3.5	CPI	Repo rate (1 day) (+FOREX)	2 years	Committee
Indonesia	00.1	4-6	CPI	BI rate (+FOREX)	Medium to long-term	Committee
Romania	05.3	2.8-3.8	CPI	Monetary policy rate	Medium-term	Committee
Turkey	06.1	3-5	CPI	Overnight rate[5]	3 years	Committee
Albania	05.1	2-4	CPI	Repo rate (1 week)	Medium to long-term	Committee
Kazakhstan	04.1	16-18	CPI	Short-term notes (28 days) (+FOREX)	3 years (cut to 2 years in 2008)	Committee
Slovak Rep.[6]	05.1	<2	CPI§§	2 week repo	3 years	Committee

Note: A separate appendix provides sources and other details about the contents of this Table.

* in the 1997 Policy Targets Agreement, CPIX (CPI ex of credit services was targeted); otherwise the target is in terms of the CPI.

** Before 2003 the target is in terms of the RPIX (retail price idex, excluding mortgage costs); thereafter the CPI is targeted.

§ The target is in terms of the IPCS or extended national CPI.

§§ The target is in terms of the € area Harmonized Index of Consumer Prices (HICP).

+ CPI excluding mortgage costs.

$ In statutes. In Canada the Governor is assisted by a Governing Council that includes Deputy-Governors. In New Zealand the Governor is also assisted by a Deputy-Governor, among other senior staff.

1 Normally, these central banks do not intervene in foreign exchange markets but reserve the right to do so. For example, in 2007, the RBNZ intervened twice in June.

2 Since 2008.

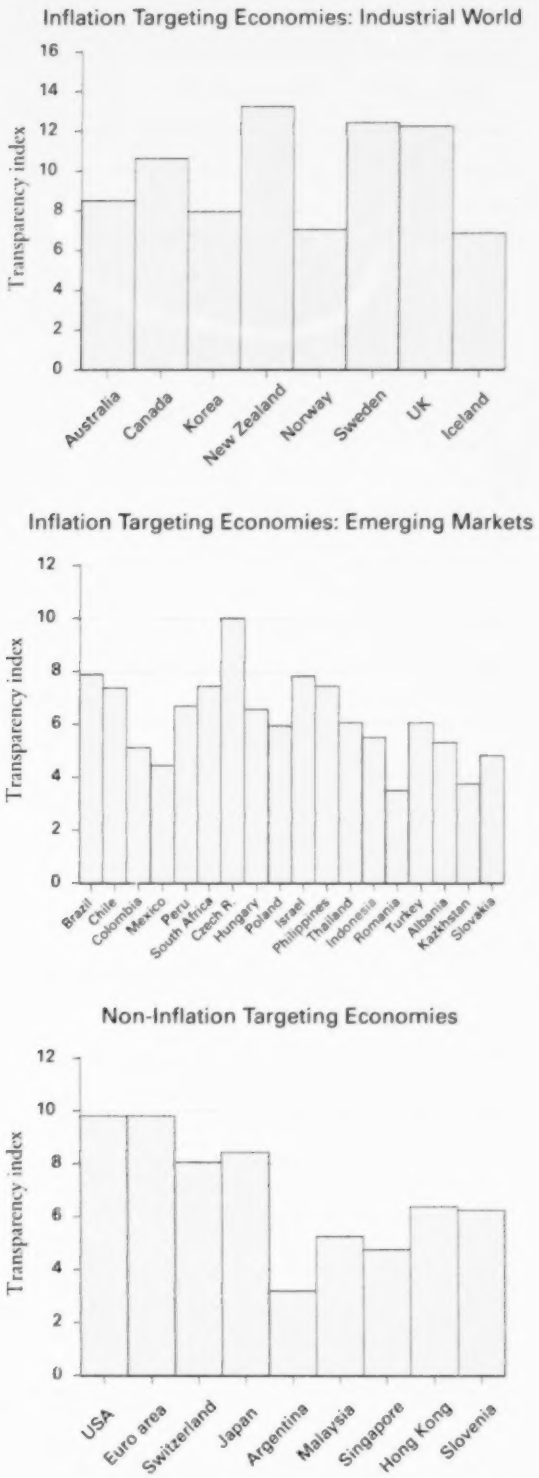
3 Although the exchange rate floats there is a ± 15% corridor, ostensibly in preparation for eventual entry into ERM II.

4 No doubt the policy horizon is somewhat influenced by the requirement of eventual euro adoption.

5 The main rate although other short-term instrument rate are also set by the central bank. Generally avoids intervention other than in exceptional cases.

6 Has hiuned the euro area in 2009. Previously, a member of ERM II.

Figure A1: Indexes of Transparency Around the World



Source: Average of total index of transparency as defined in Dincer and Eichengreen (2007), over the period 1998-2005, inclusive.

Appendix B: Taylor Rules

The Taylor rule and its variants are named after John Taylor who depicted US Federal Reserve Policy as reacting to inflation and output developments. Orphanides (2007) traces the intellectual development of the Taylor rule, which was originally 'calibrated' to the conditions prevailing in the US economy. This means that Taylor (1993) originally assumed that the real interest rate that suited the US economy in the long-run is set at 2 percent, and that the Fed, consistent with its dual mandate, is equally concerned with inflation control and ensuring adequate output and employment. Hence, the Taylor rule is written:

$$i = 2 + \pi + 0.5^{*}(\pi - 2) + 0.5^{*}(y - y^{*})$$

where i is the policy rate of the central bank (in the US the fed funds rate), π is inflation, and $(y - y^{*})$ is the amount of aggregate slack in the economy, otherwise known as the output gap.

An alternative way of writing the rule that highlights the role of inflationary shocks in influencing the setting of the policy instrument results in the following expression

$$i = 1.5^{*}(\pi - 2) + 0.5^{*}(y - y^{*}) + 4$$

Given a desired real interest rate of 2 percent, the nominal rate is larger by the amount of inflation. Next, if the central bank has a 2 percent inflation target (implicit in the case of a non inflation targeting central bank like the US Federal Reserve), inflation that exceeds this target triggers a nominal interest rate increase one and half times the amount that inflation exceeds the target. This is the so-called Taylor principle which makes clear that excessive inflation can only be eliminated by effectively raising the real interest rate as this is the signal of a tighter monetary policy. Similarly, in the event the economy is overheating (i.e., $y > y^{*}$) then the policy rate would also rise by one half of the amount by which the output gap is positive. In spite of its simplicity Taylor (1993) demonstrates that the rule fits well actual fed funds rate behaviour over the 1987-1992 period. More recently, Poole (2006) shows that a slightly modified rule fits the actual fed funds rate very well over a much longer sample (1987-2005). Poole, however, is quick to point out that the US Federal Reserve, while seemingly acting as if it follows a rule, does not do so in a slavish fashion as there are several periods when the rule shown above does not match actual fed funds behaviour. Periods of financial stress, for example, prompts the Fed not to act as if it follows a rule. Instead, a Taylor rule is best viewed as a heuristic device for understanding the core ingredients of a monetary policy strategy.

Needless to say the Taylor rule quickly became an enormously popular way of summarizing the essence of the conduct of monetary policy around the world.[38] However, there were several refinements in how economists generated evidence based on the Taylor rule.

First, as pointed out in this article, central banks tend to change the policy instrument directly under their control in a gradual manner.[39] Second, it is not clear that a central bank places the weights on the inflation and output gaps assumed by Taylor. Instead, the weights can be estimated by allowing the expression above to hold with some error together with some allowance for gradual changes in interest rates, known as the interest rate smoothing phenomenon. Indeed, it is not obvious that all central banks either have a 2 percent target or assume a 2 percent real interest rate in mind. This implies a Taylor rule of the form

$$i_t = (1-\rho)(i^{*} + \pi^{*}) + \phi_{\pi}(\pi_t - \pi^{*}) + \phi_y(y_t - y^{*}) + \rho i_{t-1} + \varepsilon_t$$

where ρ is the interest rate smoothing parameter, i^{*} and π^{*} are the desired real interest rate and inflation target, t identifies time,

38 Google Scholar returns 7280 articles about the Taylor rule while EconLit returns 488 items involving the Taylor rule.

39 It is still not entirely understood why. Empirically, the need to gradually influence expectations, uncertainty about future economic conditions, a desire not to change interest rates too often or for the decision makers to look as if they are constantly flip flopping in their views about the appropriate setting of policy, are some of the explanations provided. There is perhaps more consensus about theoretical desirability to gradually change interest rates. See, for example, Woodford (2003), and Sack and Wieland (2000).

ϕ_π and ϕ_y identify the size of the response to inflation and output gap shocks, and ε_t is an error term. This modified Taylor rule makes clear that this month or this quarter's policy rate is a function of the value set in the last period. Next, as it concerns inflation targeting central banks in particular, it is unclear why the central bank does not instead respond today either to a forecast or some expectation of future inflation and the output gap. Here the time horizon the central bank has in mind comes into play. As a consequence $(\pi_t - \pi^*)$ is replaced by $E_t(\pi_{t+1} + \pi^*)$ where E_t is the expectation of inflation i periods ahead, conditional on information available at time t. A similar expression could be used to replace the output gap term in the above equations.[40]

Since the US is not a small open economy, and there have also been suggestions that central banks ought to react to asset prices, variants of the Taylor rule with interest rate smoothing appeared that added an exchange rate or some other variable, such as stock returns. Nevertheless, the broad consensus is that these variables do not belong in a Taylor rule for a variety of empirical and theoretical reasons (see, for example, Clarida 2001; Fuhrer and Tootell 2004).

Finally, one would be remiss if the distinction between estimated and optimal rules is not briefly discussed. Versions of the Taylor rule discussed above did not make reference to whether the weights, estimated or calibrated, represent the preferences of the central bank, the public, or both. Therefore, without any knowledge of the objective function of the central bank – this describes the preferences of the monetary authority, and the extent to which it values deviations of inflation and the output gap from their respective targets – it is difficult to ascertain whose weights the parameters ϕ_π and ϕ_y refer to. Once the objective function of the monetary authority is defined[41] then one can derive a form of the reaction function that characterizes the weight the central bank actually places on inflation versus output outcomes.

40 A Variety of technical issues arise from such specifications since the expectation of inflation, unless some forecasted value is used, is not observed. Space limitations prevent a fuller discussion. See, however, Favero (2001).

41 Usually, the objective function is described by a quadratic equation that implies costs to the central bank for missing the inflation target or allowing the output gap to deviate from zero. In principle, the objective function could also include other variables, such as an interest rate smoothing term to capture the fact that there are costs to changing interest rates too often or an exchange rate. See, for example, Woodford (2003).

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